

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

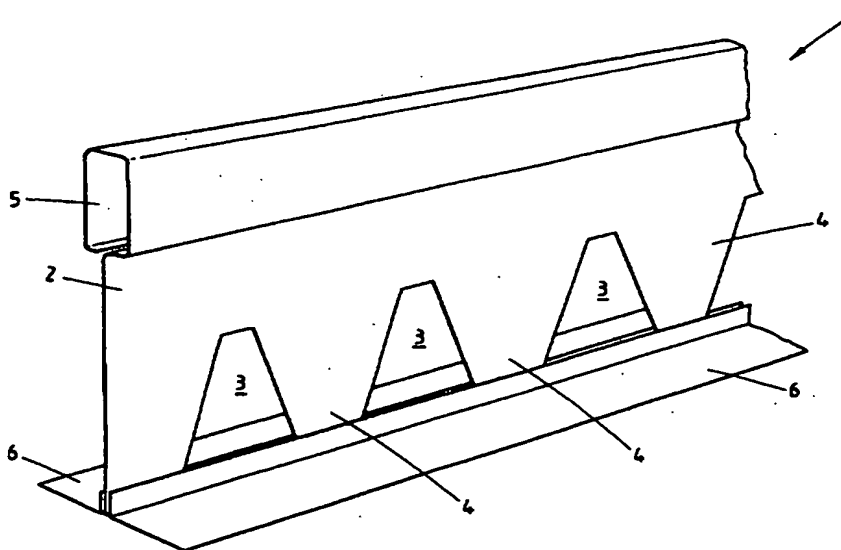
(51) International Patent Classification <sup>6</sup> : E04B 9/06, E04C 3/09	A1	(11) International Publication Number: WO 97/12101
		(43) International Publication Date: 3 April 1997 (03.04.97)

(21) International Application Number: PCT/BE96/00095  
(22) International Filing Date: 17 September 1996 (17.09.96)  
(30) Priority Data:  
9500791 26 September 1995 (26.09.95) BE  
(71) Applicant (for all designated States except US): CHICAGO  
METALLIC CONTINENTAL N.V. [BE/BE]; Oud Sluis-  
straat 5, B-2110 Wijnegem (BE).  
(72) Inventor; and  
(75) Inventor/Applicant (for US only): BAETEN, Ton [NL/NL];  
Dotterbeemd, NL-5551 GH Dommelen (NL).  
(74) Agents: PIERAERTS, J. et al.; Gevers Patents, Holidaystraat  
5, B-1831 Diegem (BE).

(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ,  
BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility  
model), DE, DE (Utility model), DK, DK (Utility model),  
EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE,  
HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,  
LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL,  
PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), TJ,  
TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE,  
LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG,  
KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE,  
DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE),  
OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR,  
NE, SN, TD, TG).

Published  
With international search report.

(54) Title: METHOD FOR FORMING A SUPPORTING PROFILE FOR CEILING PLATES AND THUS OBTAINED SUPPORTING  
PROFILES



(57) Abstract

The invention relates to a method for forming a supporting profile (1) for ceiling plates, characterised in that use is made of a metal tape (2), from which two similar strips originate, by splitting said metal tape in two, in longitudinal direction along a broken cutting line, in such a way that a succession of geometrical figures (3, 4) is formed on both strips and both strips form each other mirror image, and that each strip is provided with wings (6) for supporting the ceiling plates and that finally said continuous profile (1) is mounted on each strip of formed therefrom. The invention also relates to the thus obtained supporting profile.

BEST AVAILABLE COPY

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

**"Method for forming a supporting profile for ceiling plates and thus obtained supporting profiles"**

---

This invention relates to a method for forming a supporting profile for ceiling plates or the like, which contains two wings for receiving ceiling plates, a body and a continuous profile for fixing the supporting profile.

It is the aim of the invention to develop a method which allows to provide profiles of the type mentioned above, which have as main characteristic that a substantial saving of material can be obtained, which, in this field, has not been realised up to now, and which in spite of their lower weight, show a sufficient inertia momentum.

To achieve this according to the invention, use is made of a metal tape, from which two similar strips originate, by splitting said metal tape in two in longitudinal direction along a broken cutting line, in such a way that successive geometrical figures are formed on both strips and both strips form each others mirror image, and that each strip is provided with wings for supporting the ceiling plates and that finally said continuous profile is mounted on each strip or formed therefrom.

According to a first embodiment of the invention, said cutting line is drawn in such a way that on each strip an alternation of triangular notches and triangular protrusions is formed.

According to a second embodiment of the invention, said cutting line is drawn in such a way

that on each strip an alternation of rectangular notches which proceed into triangular notches, and rectangular protrusions which proceed into triangular protrusions, is formed.

5                   According to a preferred embodiment, said wings for supporting the ceiling plates are formed by cutting said ends of said triangular protrusions, respectively the rectangulars which extend these  
10                   triangular protrusions, in the middle along their longitudinal plane of symmetry, and by folding the thus formed lips over 90° alternating to the left and to the right, whereafter a finishing strip is applied over said lips.

                  According to a further embodiment, use  
15                   is made of said two strips originating from one and the same metal tape, whereby the triangular protrusions are folded over 90°, in one direction, near to their top and basis, for forming using parts, whereafter the locally folded strips are placed against each other  
20                   back to back, and said wing parts with finishing strips, which form the actual wings, are covered.

                  The invention also relates to the supporting profiles which are obtained according to the different methods.

25                   Other details and advantages of the invention will become clear from the following description of a method for forming a supporting profile for ceiling plates and the supporting profiles obtained with this method. This description is only  
30                   given as an example and is not meant to limit the scope of the invention in any way. The reference numbers relate to the attached figures.

                  Figure 1 is a perspective view of a supporting profile obtained with the method according  
35                   to the invention.

Figure 2 is a perspective view of a supporting profile according to a first embodiment of the method of the invention.

5 Figure 3 is a perspective view of a supporting profile obtained according to a second embodiment of the method of the invention.

The supporting profile 1 shown in figure 1, is formed by applying the method according to any one of claims 1 or 2. The supporting profile 1 is indeed formed by dividing a metal tape 2 in two in longitudinal direction, along a broken cutting line. In this way, two strips are formed which are characterized by each a success of geometrical figures. Each strip of metal tape can thus be seen as the mirror image of the other strip.

15 In the embodiment shown in figure 1, said geometrical figures correspond with a series of triangular notches 3 and triangular protrusions 4.

The continuous profile 5 with which the supporting profile can be suspended is formed from the metal tape 2, simultaneously with the division of the metal tape in two similar strips. Apparently, the formation of the continuous profile 5 can be performed in a separate step.

25 The wings 6 are connected to the triangular protrusions 4, by using a suitable and generally known method. Ceiling plates and the like can rest on these wings.

Figure 2 shows a profile which differs somewhat from the supporting profile described above.

30 The supporting profile according to figure 2 is also formed by dividing a metal tape 2' in two similar parts. In this metal tape 2', an alternation of rectangular notches 7 which each time proceed into triangular notches 8, is formed.

35

Between said rectangular notches 7 with their triangularly extended parts, each time, opposite rectangular protrusions 9 are formed, which proceed into triangular protrusions 10 in the direction of their free end.

It is characteristic for this embodiment that each triangular protrusion 10 proceeds into lips 11, which are bent over 90°, alternately to the left and the right with respect to the longitudinal symmetry plane of the supporting profile. The lips are formed by cutting the rectangular or substantially rectangular ends of the triangular protrusions 10 in the middle, along their longitudinal plane of symmetry.

A finishing strip is provided over the thus formed lips 11. Ceiling plates and the like can rest on this finishing strip.

Also the supporting profile 12 of figure 3 is formed by dividing a metal tape 1 in two along a cutting line, in such a way that two strips are formed which are characterised by a succession of triangular protrusions 13 and 13'.

One strip consisting of triangular protrusions 13 is placed back to back against a strip with triangular protrusions 13', in such a way that each triangle 13' of one strip fits precisely between two triangular protrusions 13 of another strip.

This arrangement is clearly shown in figure 3. At the top (this is meant to be the top in the using position of the supporting profile), each triangular protrusion 13, 13' is bent outwardly over 90°. These outwardly bent ends 14, respectively 14', can be considered as being wing parts. A finishing strip 15 is attached over these bent borders.

At the bottom (to be understood in the using position) the rectangular protrusions 13, 13' are

bent outwardly over 90°. The outwardly bent bases of the protrusions 13 and 13' are clarified by means reference 16. It should be remarked that between the basis of two successive triangular notches 13, 13', a  
5 part 16 which belongs to the original metal tape, connects two successive triangular protrusions. Also, these over 90° outwardly bent ends of the triangular protrusions can be seen as parts of the wings. The wings are covered with a finishing strip 17. The  
10 finishing strip 16 is applied according to any method known from the art to be described further.

The invention is not limited to the embodiment described above and a number of variations can be applied, as far as they fall within the scope of  
15 the attached claims.

CLAIMS.

1. Method for forming a supporting profile for ceiling plates or the like, which contains two wings for receiving ceiling plates, a body and a continuous profile for fixing the supporting profile, characterised in that use is made of a metal tape, from which two similar strips originate, by splitting said metal tape in two in longitudinal direction along a broken cutting line, in such a way that a succession of geometrical figures is formed on both strips and both strips form each others mirror image, and that each strip is provided with wings for supporting the ceiling plates and that finally said continuous profile is mounted on each strip or formed therefrom.

2. Method according to claim 1, characterised in that said cutting line is drawn in such a way that on each strip an alternation of triangular notches and triangular protrusions is formed.

3. Method according to claim 1, characterised in that said cutting line is drawn in such a way that on each strip an alternation of rectangular notches which proceed into triangular notches, and rectangular protrusions which proceed into triangular protrusions, is formed.

4. Method according to claim 3, characterised in that each triangular protrusion proceeds into a rectangular uitsprong, which is outwardly bent over 90°.

5. Method according to any one of claims 1 and 2, characterised in that said wings for supporting the ceiling plates are formed by attaching L-shaped profiles at the ends of said triangular protrusions.

6. Method according to any one of



claims 1 to 4, characterised in that said wings for supporting the ceiling plates are formed by cutting said ends of said triangular protrusions, respectively the rectangulars which extend these triangular protrusions, in the middle along their longitudinal plane of symmetry, and by folding the thus formed lips over 90° alternately to the left and the right, whereafter a finishing strip is applied over said lips.

7. Method according to any one of claims 1-6, characterised in that use is made of said two strips originating from one and the same metal tape, whereby the triangular protrusions are folded over 90°, in one direction, near to their top and basis, for forming the wing parts, whereafter the locally folded strips are placed against each other back to back, and said wing parts are covered with finishing strips which form the actual wings.

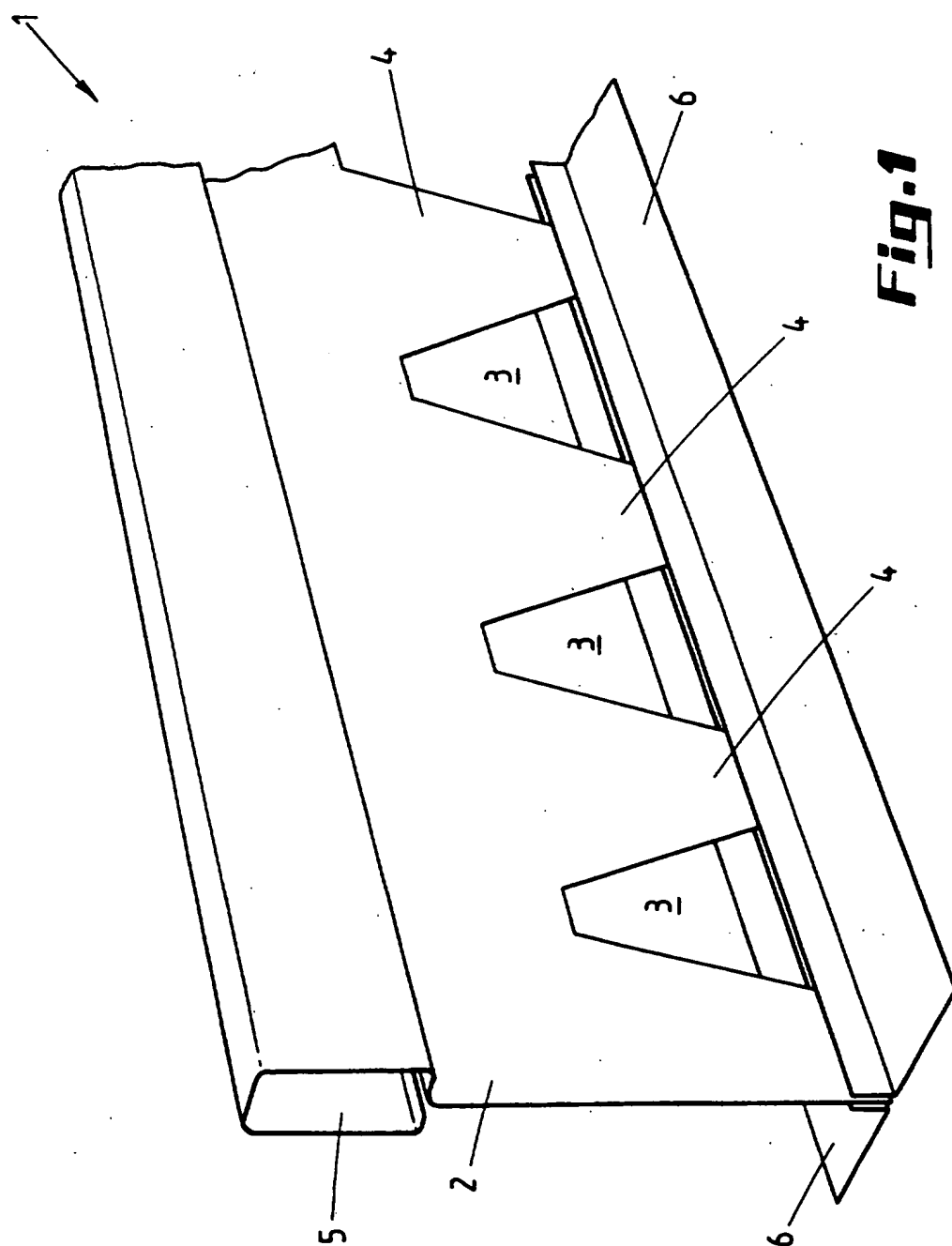
8. Method according to claim 7, characterised in that said two strips are placed against each other in such a way that a triangular protrusion of one strip fits precisely between two triangular protrusions of the other strip.

9. Supporting profile for ceiling plates consisting of a body, wings for supporting said ceiling plates and a continuous profile for fixing said supporting profile, characterised in that said body presents triangular notches applied in a metal tape, which metal tape also forms a continuous hollow compartment for suspending the supporting profile, while said wings consist of L-shaped profiles which are attached to said strip.

10. Supporting profile obtained with the method according to any one of claims 1-6, characterised in that said profile consists of a metal tape of which one border is bent for forming a

continuous profile for fixing the supporting profile, while the wings of the supporting profile are formed by a finishing strip provided on alternately left and right bent lips which belong to said metal tape.

- 5                   11. Supporting profile obtained with the method according to any one of claims 1, 7 and 8, characterised in, that said profile consists of a combination of two back to back placed metal tape strips, of which the triangular protrusions of one  
10 strip fit precisely between the triangular protrusions of the other strip and the wings for supporting the ceiling plates as well as the continuous profile for suspending the supporting profiles are formed by covering the bent borders of each strip with a  
15 finishing strip.



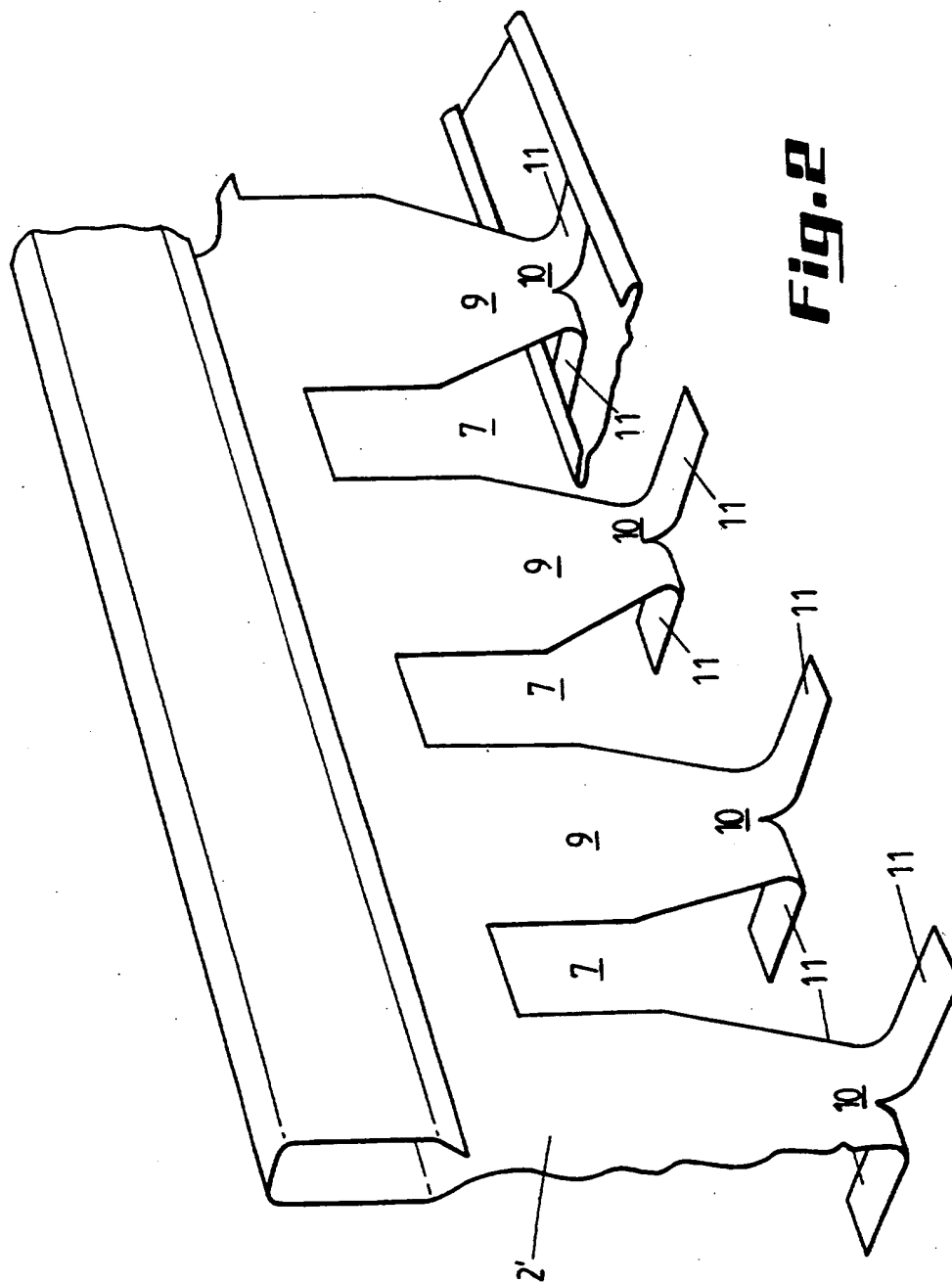
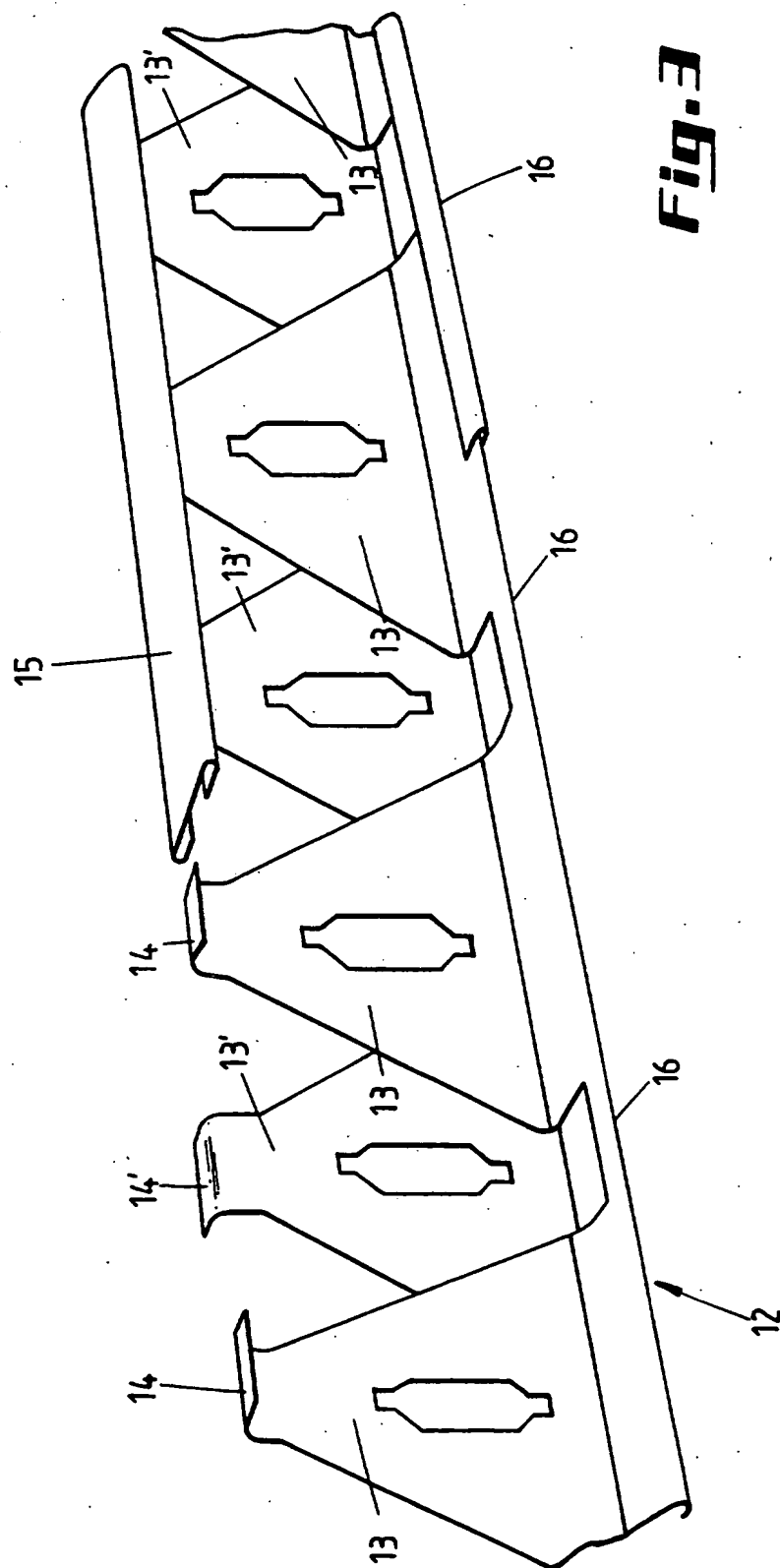


Fig. 2



**Fig. 3**

# INTERNATIONAL SEARCH REPORT

Inter nal Application No  
PC1/BE 96/00095

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 E04B9/06 E04C3/09

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 E04B E04C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE,U,86 07 709 (PAG PRESSWERK) 30 April 1986	1,3,4
A	see the whole document	10
Y	FR,A,2 095 209 (STATION D'ESSAIS ET DE RECHERCHES DE LA CONSTRUCTION MÉTALLIQUE) 11 February 1972	1,3,4
A	see page 3, line 11 - page 3, line 18 see page 5, line 4 - page 5, line 14 see page 5, line 32 - page 5, line 36 see figures 1,2,6,7	8,11
Y	GB,A,504 405 (WEAKLEY) 25 April 1939	9
A	see page 2, line 102 - page 2, line 111 see figures 1,2	5
	--- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*Δ\* document member of the same patent family

Date of the actual completion of the international search

13 November 1996

Date of mailing of the international search report

28. 11. 96

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+ 31-70) 340-3016

Authorized officer

Hendrickx, X

# INTERNATIONAL SEARCH REPORT

Inter- national Application No  
PCT/BE 96/00095

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	GB,A,937 440 (THE UNITED STEEL COMPANIES) 18 September 1963	9
A	see page 1, line 56 - page 1, line 62 see figures 1,2	1,9
A	DE,A,24 33 142 (MALIK) 22 January 1976  see page 5, paragraph 3 - page 6, paragraph 2 see page 8, paragraph 5 - page 9, paragraph 2 see figures 1,2,6-8	1,2,7,8, 11
A	NL,A,6 717 384 (POPKEN) 27 January 1969 see page 4, line 22 - page 4, line 35 see figures 4,5	6,10,11
A	GB,A,2 026 586 (DONN PRODUCTS) 6 February 1980	

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/BE 96/00095

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-U-8607709	30-04-86	NONE	
FR-A-2095209	11-02-72	BE-A- 751951 LU-A- 63284	14-12-70 13-09-71
GB-A-504405		NONE	
GB-A-937440		NONE	
DE-A-2433142	22-01-76	NONE	
NL-A-6717384	27-01-69	BE-A- 708846	16-05-68
GB-A-2026586	06-02-80	US-A- 4206578 CA-A- 1130972 DE-A- 2930470 FR-A- 2432584 US-E- RE31528	10-06-80 07-09-82 21-02-80 29-02-80 06-03-84



**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☒ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**

**THIS PAGE BLANK (USPTO)**

**THIS PAGE BLANK (USPTO)**